

WHAT IS CLAIMED IS:

1. Look-ahead split release apparatus for a slave device coupled to a data bus for transferring data between the slave device and a plurality of master devices, the slave device including a return command register for storing identifications on a first-in, first-out order of split master devices for which data are returned, the apparatus comprising:

a staging register coupled to the return command register for storing an identification of a master device whose command is highest in order in the return command register; and
a control device responsive to a command from a master device and to an identification in the staging register to release a split of the master device next in the return command register.

2. Apparatus according to claim 1, wherein the control device compares the identification in a command from the master device to an identification in the staging register and releases a split of that master device if the identifications match.

3. Apparatus according to claim 2, wherein the control device includes a validation register containing a representation of the validity of an identification in the staging register, the control device being responsive to the representation that

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the identification in the staging register is invalid to transfer the next-ordered identification from the return command register to the staging register, to validate the first identification and to release the split of the corresponding master device.

4. Apparatus according to claim 3, wherein the control device is further responsive to a command from the corresponding master device to invalidate the first identification.

5. Apparatus according to claim 3, wherein the return command register includes a counter providing an indication of whether the return command register is empty, the validation register being responsive to the indication that the return command register is empty to inhibit validation of an identification in the staging register.

6. Apparatus according to claim 1, wherein the control device includes a validation register containing a representation of the validity of an identification in the staging register, the control device being responsive to the representation that the identification in the staging register is invalid to transfer the next-ordered identification from the return command register to the staging register, validate the first identification and release the split for the corresponding master device.

7. Apparatus according to claim 6, wherein the control device is further responsive to a command from the corresponding master device to invalidate the first identification.

8. Apparatus according to claim 6, wherein the return command register includes a counter providing an indication of whether the return command register is empty, the validation register being responsive to the indication that the return command register is empty to inhibit validation of an identification in the staging register.

9. A process of releasing a split mode to a master device in a data bus system, wherein a slave device provides the split mode to deny the respective master device use of the data bus, the process comprising steps of:

- a) receiving, in an order, identifications for each split master device for which data are returned to the slave device;
- b) staging the received identification of a first master device;
- c) releasing a split mode of the first master device;
- d) receiving an identification from the bus representing the first master device;

- e) comparing the identification received from the bus to the staged identification;
- f) in response to a match at step (e), staging a receive identification of a second master device next in the order; and
- g) releasing the split mode of the second master device.

10. The process of claim 9, wherein step (a) is performed by a register that receives the identifications on a first-in, first-out basis, the process further comprising steps of:

- h) identifying whether the register is empty, and
- i) performing steps (f) and (g) only if step (h) identifies that the register is not empty.

11. The process of claim 9, further including steps of:

- h) simultaneously with step (g), invalidating the staged identification of the first master device; and
- i) subsequent to step (h), staging the identification of the next master device.

12. The process of claim 11, further including steps of:

- j) identifying whether the next staged master identification is valid, and
- k) performing steps (e), (f) and (g) if the next staged master identification is valid.

13. In a data bus for transferring data between a slave device and each of a plurality of master devices, in which an arbiter arbitrates use of the data bus among the master devices so that each master device can issue commands to the slave device to transfer data, and wherein the slave device provides a split to deny the respective master device use of the bus if the slave device cannot respond to a command, a process of releasing a split of a master device comprising steps of:

- a) storing master device identifications associated with data returned in response to commands from split master devices, the identifications being stored in order of return;
- b) staging the identification of a master device that is split that is highest in order;
- c) releasing the split of the master device upon staging its identification,
- d) receiving a master identification associated with a command from a master device;

- e) identifying a match between the staged identification and the identification received in step (d); and
- f) in response to a match at step (e), repeating steps (b) to (e) for a master device next in order.

14. The process of claim 13, further including:

- g) in response to a match at step (e), invalidating the staged identification of the first-named master device.

15. The process of claim 14, further including steps of:

- h) simultaneously with step (b), validating the staged identification,
- i) performing step (c) if the staged identification is valid.

16. The process of claim 15, wherein step (i) is performed by identifying if data are present in a data queue.

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